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- (54) WOUND DRAINAGE DEVICE
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(57) Claim

1. A surgical suction device comprising a drainage bag having flexible side walls to permit the bag to be rolled-up into an inoperative position and unrolled into an operative position, a body of resilient material disposed within the bag and adapted to be compressed when the bag is rolled-up into an inoperative position, an inlet port in the bag adapted for connection to a drainage tube, and releasable retaining means for retaining the bag in the inoperative position, wherein the body of the resilient material is adapted to expand when the bag is released from the inoperative position so as to cause the side walls of the bag to move apart and thereby develop at least a partial vacuum within the bag.

THIS INVENTION relates to a surgical suction device for evacuating fluids from the body of a patient.

10 The accumulation of tissue fluids and blood may interfere with the proper healing of a wound. To reduce this problem, it is a common medical practice to evacuate the tissue fluids and blood from the site of the wound by means of a wound suction system. A typical wound suction system comprises an evacuator in which a region of at least partial vacuum is created. A drainage tube is installed in the vicinity of the wound and coupled to the evacuator by way of a connector tube. The partial vacuum in the evacuator draws tissue fluid, blood and debris from the vicinity of the wound so as to promote proper healing. In one common type of wound suction system, the evacuator comprises a vacuum bottle in which a partial vacuum may be created by means of a manometric stopper. In another type of wound suction system, the evacuator comprises an evacuation chamber having one wall thereof movable between extended and retracted positions and biased towards the extended position. Fluid is expelled from the evacuation chamber on movement of the movable wall to the retracted position and at least a partial vacuum is developed in the evacuation chamber as the wall returns to its extended position.

It is an object of this invention to provide a surgical suction device which is of simpler construction and which is less expensive to produce than the devices referred to hereinbefore.

30 In one form the invention resides in a surgical suction device comprising a drainage bag having flexible side walls to permit the bag to be rolled-up into an inoperative position and unrolled into an operative position, a body of resilient material disposed within the bag and adapted to be compressed when the bag is rolled-up into the inoperative position, an inlet port in the bag adapted

for connection to a drainage tube, and releasable retaining means for retaining the bag in the inoperative position, wherein the body of resilient material is adapted to expand when the bag is released from the inoperative position so as to cause the side walls of the bag to move apart and thereby develop at least a partial vacuum within the bag.

10 The invention will be better understood by reference to the following description of one specific embodiment thereof as shown in the accompanying drawings in which:

Figure 1 is a schematic perspective view of a surgical suction device according to the embodiment;

Figure 2 is a schematic perspective view of the drainage bag rolled-up into the inoperative position;

Figure 3 is a schematic perspective view of the drainage bag unrolled into the operative position; and

Figure 4 is a sectional elevational view on the line 4-4 of Figure 3.

20 Referring to the drawings, the surgical suction device comprises a bag 11 the side walls 13 of which are formed of transparent flexible material. The bag is fitted with an inlet port 15; apart from the inlet port 15 the bag, is hermetically sealed. The inlet port 15 is defined by an inlet tube 17 located at one end of the bag. The inlet tube 17 is preferably fitted with a one-way valve 19 which permits fluid flow into, but not fluid flow out of, the bag. In the illustrated arrangement the one-way valve is in the form of a flutter valve fitted onto the inner end of the inlet tube 17.

30 Because of the flexible nature of the side walls 13, the bag 11 may be rolled-up, from its end opposite the inlet tube 17, into an inoperative position (as shown in Figure 2) and unrolled into an operative position (as shown in

Figures 1, 3 and 4). A releasable retaining means 21 is provided to selectively retain the bag in the inoperative position. In the illustrated arrangement, the retaining means comprises one or more strips of adhesive tape extending between the outer end of the bag and the adjacent portion of the exposed wall of the bag.

10 A body of resilient material 23, such as foamed polyurethane or other sponge-like material, is located within the bag. The resilient material preferably is absorbent, as is the case with foamed polyurethane.

In the illustrated arrangement, the body of resilient material 23 is substantially rectangular in both plan and elevation. It should be appreciated, however, that the body may be of any appropriate configuration. In addition the body may be of unitary nature, as is the case with the present embodiment, or may be in the form of a plurality of pieces of resilient material.

20 The body of resilient material 23 is adapted to be compressed when the bag is rolled-up into the inoperative position. Air is expelled from the bag either prior to or during the action of rolling-up the bag to permit the body of resilient material 23 to be tightly compressed as the bag is rolled-up. In the case where the air is expelled prior to the valve being rolled-up, this procedure would preferably be carried out during the manufacturing stage after insertion of the body of resilient material into the bag. In the case where air is expelled by the action of the bag being rolled-up, it is necessary that means be provided to permit the egress of air.

30 The inlet tube 17 is connectable to a conventional drainage tube 25 by means of a connecting tube 27.

To drain tissue fluids and blood from the region of a wound to promote healing, a surgeon installs the drainage tube 25 in the conventional manner in the vicinity of the

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wound. The exposed end of the drainage tube is coupled to the bag 11 by means of the connecting tube 27. When suction is to be applied, the retaining means 21 is released to permit the bag to be unrolled. This in turn permits the body of resilient material to expand and thereby cause the side walls 13 to move outwardly with respect to each other. In this way, a reduced pressure is developed in the bag and the resultant suction induces tissue fluids, blood and debris at the wound site to flow into the drainage tube 25 and ultimately discharge into the drainage bag 11. Because of its absorbent nature, the body of resilient material 23 is able to take-up a portion of the evacuated fluid so increasing the volume of fluid which the bag may hold.

When the drainage bag is full, or no longer required, it may be discarded.

It is a simple procedure to replace a full bag with a fresh one, it merely being necessary to detach the full bag from the connecting tube 27 and install the fresh one.

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It should be appreciated that the suction device according to the invention may also be used to evacuate fluids from body cavities.

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Furthermore, it should be appreciated that the scope of the invention is not limited to the scope of the embodiment described. For example the drainage bag may be provided with a outlet valve whereby the contents of the bag may be emptied to permit the bag to be reused rather than replaced. The outlet valve is normally closed. When the drainage bag is to be emptied, the valve is opened to permit the contents of the bag to be discharged. With the valve open the bag is then rolled-up to dispeil any air inside and recompress the body of resilient material. With the bag rolled-up, the outlet valve is closed and the suction device ready for reuse. This procedure may be carried out while the suction device remains attached to the patient.

THE CLAIMS defining the invention are as follows:

1. A surgical suction device comprising a drainage bag having flexible side walls to permit the bag to be rolled-up into an inoperative position and unrolled into an operative position, a body of resilient material disposed within the bag and adapted to be compressed when the bag is rolled-up into an inoperative position, an inlet port in the bag adapted for connection to a drainage tube, and releasable retaining means for retaining the bag in the inoperative position, wherein the body of the resilient material is adapted to expand when the bag is released from the inoperative position so as to cause the side walls of the bag to move apart and thereby develop at least a partial vacuum within the bag.
2. A surgical suction device as claimed in claim 1 wherein the resilient material is absorbent.
3. A surgical suction device as claimed in claim 1 or 2 wherein the resilient material is foamed polyurethane or like sponge-like material.
4. A surgical suction device as claimed in claim 1, 2 or 3 wherein the body of resilient material is a unitary body.
5. A surgical suction device as claimed in claim 1, 2 or 3 wherein the body of resilient material comprises a plurality of pieces of resilient material.
6. A surgical suction device as claimed in any one of the preceding claims wherein the inlet port is provided with a non-return valve.
7. A surgical suction device as claimed in any one of the preceding claims wherein the inlet port is defined by an inlet tube provided at one end of the bag.

8. A surgical suction device as claimed in any one of the preceding claims wherein the releasable retaining means comprises one or more strips of adhesive tape adhesively bonded between the outer end of the bag and the adjacent portion of the exposed wall of the bag.

9. A surgical suction device substantially as herein-described with reference to the accompanying drawings.

DATED this TWENTY SIXTH day of AUGUST 1922.

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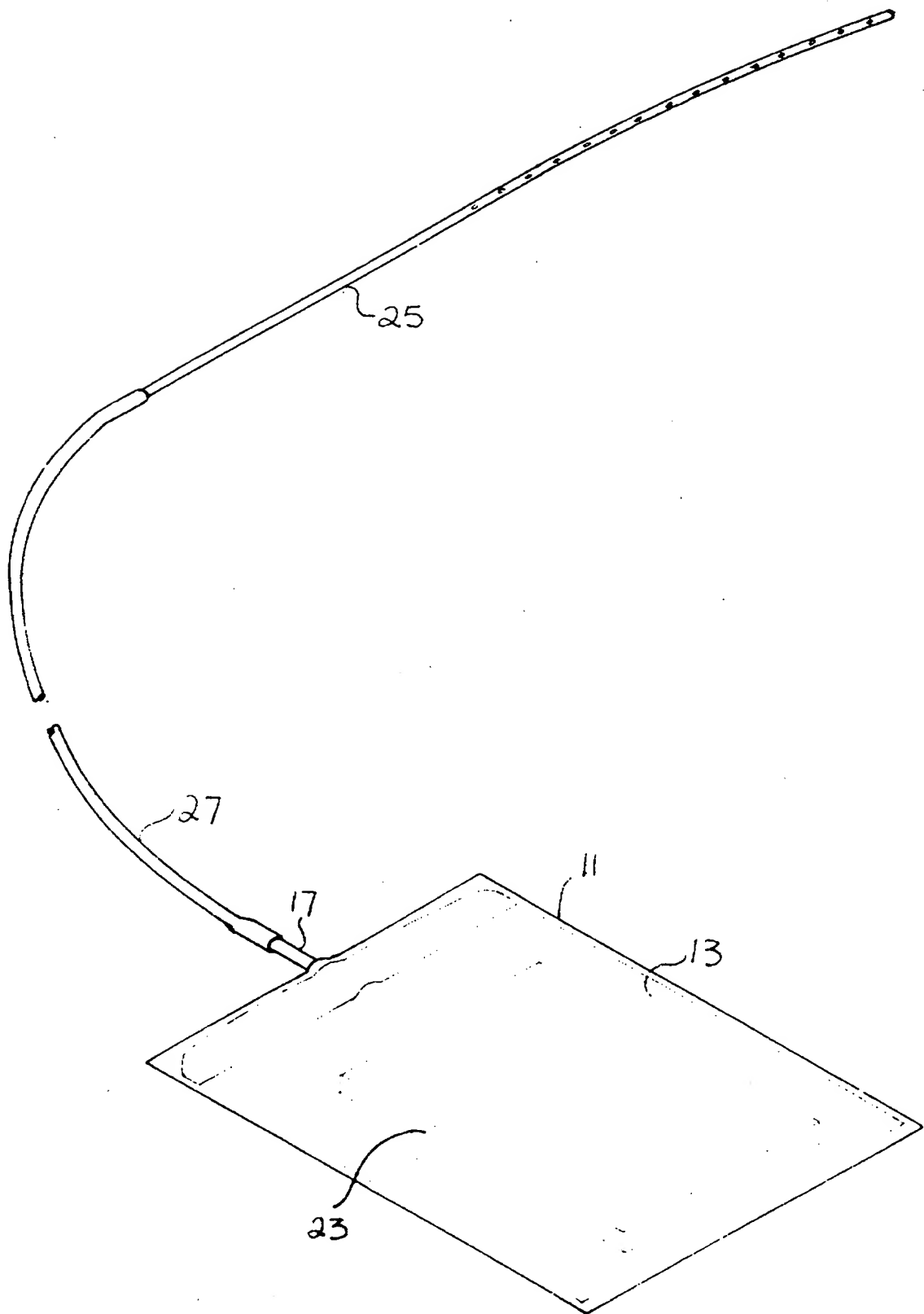


Fig. 1.

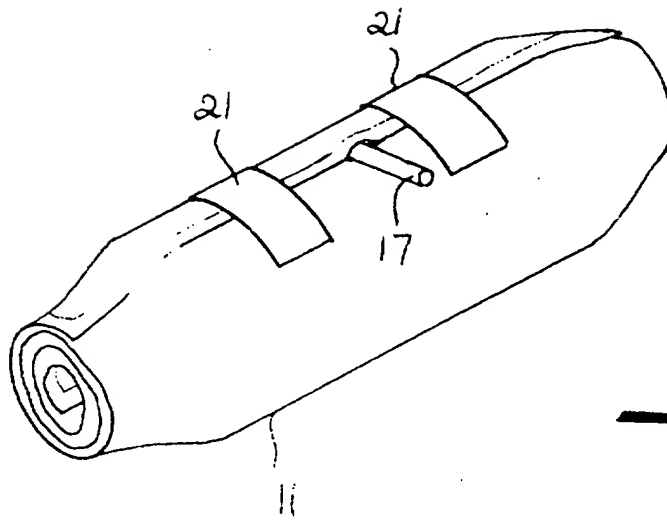


Fig. 2

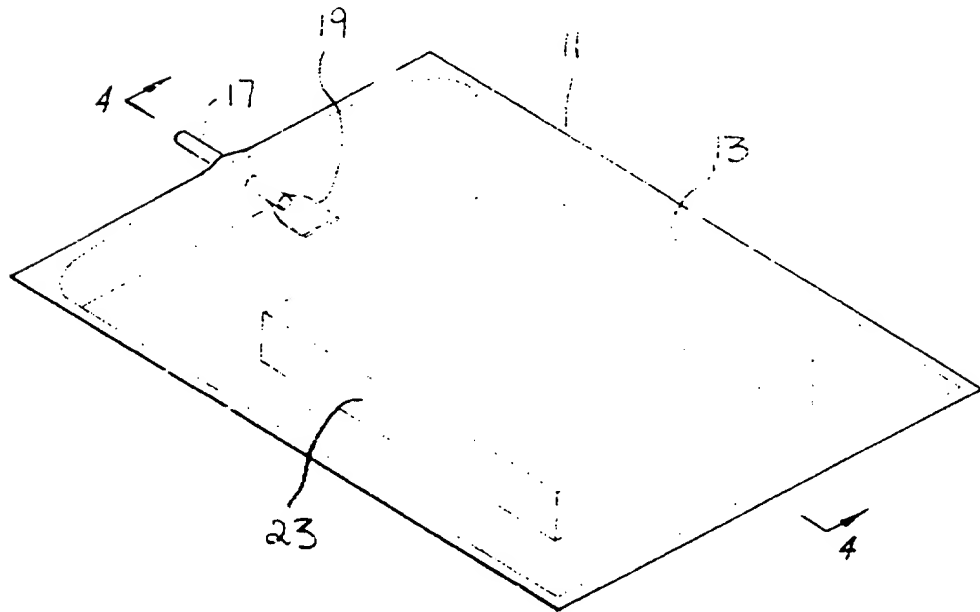


Fig. 3

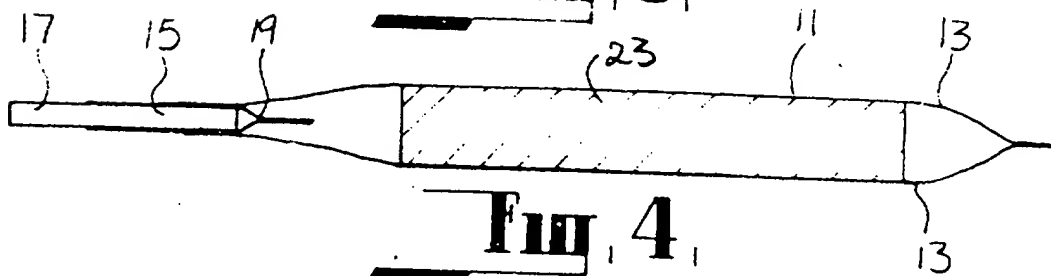


Fig. 4